

Claims

For the convenience of the Examiner, all pending claims are set forth below.

1. (Original) A method, comprising:
introducing an exogenous fluorescent contrast agent into a biologic tissue, the tissue multiply scattering light with a mean time-of-flight, and the agent having a fluorescence lifetime within a factor of about ten of the mean time-of-flight;
exposing the tissue to an excitation light with a predetermined time-varying intensity;
detecting a light emission from the tissue in response to said exposing;
generating an image of the tissue by mapping spatial variation of a level of a fluorescence characteristic of the tissue from the light emission in accordance with a mathematical expression modeling multiple light scattering behavior of the tissue; and
wherein the agent is selected in accordance with a predetermined relationship between degree of image contrast and at least one of fluorescence yield or the fluorescence lifetime.
2. (Original) The method of claim 1, wherein the at least one is fluorescence lifetime.
3. (Original) The method of claim 1, wherein the fluorescence lifetime is in a range of about 0.1 to 10 nanoseconds.
4. (Original) The method of claim 1, wherein the fluorescence lifetime is in a range of about 0.5 to 5 nanoseconds.
5. (Original) The method of claim 1, wherein the fluorescence lifetime is in a range of about 0.2 to 2 nanoseconds.
6. (Original) The method of claim 1, wherein the mathematical expression corresponds to a diffusion equation approximation of multiply scattered light.

7. (Original) The method of claim 1, wherein the fluorescence characteristic is at least one of fluorescence lifetime, fluorescence yield, or fluorescence quantum efficiency.

8. (Original) The method of claim 1, wherein said generating includes determining a modulation amplitude change and a phase change of the light emission relative to the excitation light.

9. (Original) The method of claim 8, wherein the fluorescence characteristic corresponds to the fluorescence lifetime.

10. (Original) The method of claim 9, wherein the mathematical expression is in a frequency domain form and the image contrast is provided in terms of at least one of phase shift contrast or modulation contrast.

11. (Previously Presented) A method comprising:
selecting a fluorescent contrast agent as a function of a predetermined time-of-flight for a tissue to be imaged in accordance with a mathematical expression modeling the behavior of multiply scattered light traveling through the tissue, the fluorescent contrast agent having a fluorescence lifetime within a factor of ten of the predetermined time-of-flight; and
providing the fluorescent agent for introduction into the tissue.

12. (Original) The method of claim 11, wherein the fluorescence lifetime is in a range of about 0.1 to 10 nanoseconds.

13. (Original) The method of claim 11, wherein the fluorescence lifetime is in a range of about 0.5 to 5 nanoseconds.

14. (Original) The method of claim 11, wherein the fluorescence lifetime is in a range of about 0.2 to 2 nanoseconds.

15. (Original) The method of claim 11, wherein the mathematical expression corresponds to a diffusion equation approximation of multiply scattered light.

16. (Original) The method of claim 11, further comprising generating an image of the tissue by mapping spatial variation of a level of a fluorescence characteristic of the tissue.

17 - 34. (Cancelled)